

Risk Assessment: Importation of Adult Queens, Package Bees and Germplasm of Honey Bees, *Apis mellifera* L., From New Zealand

Qualitative, Pathway-Initiated Pest Risk Assessment

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Agency Contact:

**Wayne F. Wehling, Ph.D.
Permits and Risk Assessment
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 133
Riverdale, MD 20737-1236**

I. Introduction

The Act of August 31, 1922, entitled “An Act to regulate foreign commerce in the importation into the United States of the adult honey bee (*Apis mellifica*)” (referred to hereinafter as the Honeybee Act of 1922), prohibits the entry of honey bees from countries where diseases and parasites harmful to honey bees are known to exist. Additional amendments and regulations, promulgated by the Department of Agriculture, extended the Act to prohibit the importation of all life stages of the genus *Apis*, which expanded the prohibition to prevent the entry of diseases and pests harmful to honey bees and undesirable germplasm. Regulations promulgated under the Honeybee Act are published in Title 7 CFR Part 322.

The diseases, pests and germplasm specifically identified in the Honeybee Act and amendments, including regulations under the Federal Plant Pest Act, as superseded by the Plant Protection Act (7 U.S.C. 7701-7772), entitled Exotic Bee Diseases and Parasites (Title 7 CFR Part 319.76), are as follows:

Exotic Bee Parasites:

Acarapis woodi
Varroa jacobsoni (= *Varroa destructor*)
Tropilaelaps clareae
Euvarroa sinhai
Coelioxys spp.
Chrysis spp.

Exotic Bee Diseases:

Aspergillus spp.
Bacillus spp.
Entomophthora spp.
Beauvaria spp.
Cordyceps spp.
Saccharomyces spp.

Because the protozoan *Nosema apis* is widespread in the United States, it is not considered an exotic disease.

Only the United States Department of Agriculture can import adult honey bees from countries other than Canada under the rules and regulations prescribed by the Secretary of Treasury and the Secretary of Agriculture. Recent trade agreements (the General Agreement on Tariffs and Trade, and the North American Free Trade Agreement) obligated the United States to consider imports of honey bees from countries where science-based analyses indicate acceptable risk levels and/or adequate risk

management tactics. This risk assessment was prepared by the Animal and Plant Health Inspection Service (APHIS) and the Agricultural Research Service (ARS) of the United States Department of Agriculture (USDA) to examine the risks associated with the importation into the United States of adult queens, package bees (adult queens, adult drones and adult workers) and germplasm (semen and ova) of honey bees, *Apis mellifera* L., from New Zealand. The methods we used to initiate, conduct, and report this pest risk assessment are consistent with guidelines provided by the United Nations, Food and Agriculture Organization (FAO) and by the Office International Epizootics (OIE). The format of this assessment is largely based on that of USDA, APHIS, Plant Protection and Quarantine (PPQ) guidelines (1997). This document satisfies the requirements of OIE Guidelines for risk assessment (OIE 2000).

II. Risk Assessment

A. Initiating Event: Proposed Action

New Zealand first requested access of their honey bees to the United States in 1978. Their request was acted upon with a risk assessment initiated in 1984. Based upon that risk assessment, a proposed rule was published in the Federal Register on February 6, 1990 (55 FR 3968-3969, Docket No. 89-117). The proposal would have relieved certain restrictions on honey bees and honey bee semen imported into the United States from New Zealand. At the time, USDA considered the proposed rule justified based on a determination by USDA that New Zealand was free of, and had adequate protection against the introduction of, diseases and parasites of honey bees, as well as undesirable species or strains of honey bee and their semen. USDA extended the proposed rule's public comment period from 60 to 90 days in a subsequent announcement published in the Federal Register on March 2, 1990 (55 FR 7499, Docket No. 90-025). The proposed rule was not initially acted upon, and the comment period for the original proposal was reopened for 30 days in a Federal Register announcement on July 18, 1994 (59 FR 36373-36374). Several of the comments received raised questions about half moon syndrome, chronic bee paralysis virus, Kashmir bee virus, melanosis, and *Malphighamoeba mellificae* that were known to occur in New Zealand, but which required further study in North America. Due to these concerns, USDA published a final rule in the Federal Register on February 1, 1995 (60 FR 5997- 6000, Docket No. 89-117-4) that amended the regulations to only allow honey bees and honey bee semen from New Zealand to transit the United States, subject to certain conditions, but did not allow full access to the United States. However, it was stated in the final rule that we would reconsider New Zealand's request as further research is conducted. New Zealand has continued to request complete access to the United States of their honey bees and honey bee germplasm since the final rule for transit became effective on March 3, 1995.

On December 9, 1999, we published in the Federal Register (64 FR 68984, Docket No. 99-091-1) a notice of availability for the draft of this risk assessment. During the 60-day comment period, we received 23 comments on the draft of this risk assessment. We have responded to all comments

received, whether relevant to the risk assessment or not, in an appendix to this risk assessment. Further, we have updated this risk assessment to reflect the detection of *Varroa destructor* on the North Island of New Zealand on April 10, 2000.

B. Previous Risk Assessments, Current Status and Pest Interceptions

In response to the 1978 request for access by New Zealand, the USDA initiated a review of the risks of such imports in 1984. A scientific literature review, a sampling program of New Zealand honey bees, an exchange of information with New Zealand, and a review of the bee enforcement program in New Zealand were conducted to determine the risks posed to the United States beekeeping industry by honey bee diseases and parasites, and undesirable species and strains of honey bees in, New Zealand. A USDA Agricultural Research Service scientist visited New Zealand from January 24 to March 17, 1984, to diagnose bee diseases and to evaluate the bee diseases situation in New Zealand (Shimanuki, 1984). A detailed report evaluating New Zealand honey bees was submitted to APHIS by the Agricultural Research Service in 1988 (Shimanuki, 1988). That report concluded that, based on visits to New Zealand and follow-up studies, no evidence of exotic diseases or pests occurred in New Zealand that would endanger honey bees in the United States.

In response to concerns about the 1989 proposed rule and the 1995 final rule, the Hawaii Department of Agriculture conducted an independent risk assessment to determine potential risks to Hawaiian honey bees posed by transshipment of New Zealand Bees (Hawaii Department of Agriculture, 1995). The results of this independent analysis supported the conclusions of the USDA evaluations completed in 1988. The conclusion to their assessment was that, relative to New Zealand honey bees, there was “no evidence to support the notion that Hawaii represents a unique repository of disease-free and genetically distinct honey bees.” However, this conclusion is no longer entirely accurate with the recent finding of varroa mite in New Zealand.

Canada has allowed the importation of honey bee queens and package bees from New Zealand since 1973. The movement of honey bees from Canada into the United States has not been regulated or restricted since Canada first allowed entry of New Zealand honey bees. Although much concern was initially raised about the inadvertent import of *Melittiphis alvearius* and half moon syndrome from New Zealand into North America, no reports have indicated adverse events in either Canada or the United States. Similarly, recent concerns about the appearance of *Varroa destructor* in New Zealand have not revealed any mites in transshipments of package bees through Hawaii to Canada (Brian Jamieson, Canada Food Inspection Agency, personal communication).

III. Assessment of New Zealand Honey Bee Regulations and Surveillance Programs

The New Zealand beekeeping industry has been regulated since the passage of the Apiary Act of 1906 (<http://www.beekeeping.co.nz/nzbkpg/legis2.htm>). The New Zealand legislation pertaining to current

beekeeping industry practices is the Biosecurity Act. The Biosecurity Order pertaining to honey bees (The National American Foulbrood Pest Management Strategy) came into effect on October 1, 1998. The management agency under this legislation is the National Beekeepers' Association of New Zealand. Their performance as a management agency is audited by the Ministry of Agriculture and Forestry (MAF).

Under the Biosecurity Act, all locations where bees are kept (apiaries) must be registered and identified with a code number. As one of the most important bee diseases in New Zealand, all occurrences of American foulbrood (AFB) are required by law to be reported. Upon detection, immediate steps must be taken to eradicate the disease. This involves burning all bees, combs, honey and hive equipment (unless permission is granted to beekeepers to sterilize hive equipment by an approved method). Use of antibiotics to prevent or treat AFB is illegal in New Zealand.

New Zealand has a very robust government program to protect its animal health, including thorough examinations of postal items, goods, passengers and passenger baggage entering the country. To prevent the introduction of bee diseases and pests, honey, other bee products, used beekeeping equipment and live bees may only be imported if they meet stringent health requirements. In practice, New Zealand does not import live bees or used beekeeping equipment, imports honey only from a few disease-free Pacific Island countries, and imports some highly- refined bee products.

All exports of queen and package bees by New Zealand to other countries are accompanied by certificates issued by the MAF. On the certificate for honey bees shipped to Canada, MAF certifies that the bees are a product of New Zealand, and that New Zealand is free of Tracheal mite (*Acarapis woodi*), Asian mite (*Tropilaelaps clareae*), European foulbrood (*Melissococcus pluton*) and the African or Africanized honey bee (*Apis mellifera scutellata*) and its hybrids.

IV. Assessment of New Zealand Honey Bee Species and Strains

The honey bee is not indigenous to New Zealand and was first imported in 1839 (MAF, 1985). Numerous importations of queens from Australia, Italy and the United States occurred until 1920. From 1924 to 1948, special permits were required to import honey bees, but very few queens were actually imported. Legislation passed in 1948 to prevent the importation of undesirable strains and exotic diseases significantly reduced imports. From 1948 to 1956, only eight consignments of queens were imported; four from the United States, one from Canada, and three from Australia. No legal importations of honey bees have been allowed since 1956.

Based on the history of honey bee importations into New Zealand, together with the absence of any reports of species other than *Apis mellifera* or of other adverse subspecies or strains, New Zealand honey bees are considered the same subspecies of honey bees in the United States.

V. Pest List: Pests Associated with Honey Bees in New Zealand

If a pest or disease of quarantine importance to the United States, as listed in the Introduction on page 2, does not appear in the following table, there is no evidence indicating that pest or disease is present in New Zealand and therefore is not likely to be present in exports from that country.

Diseases or Pests in New Zealand	In U.S.	Comments	References
Fungi			
<i>Ascosphaera apis</i> (Chalkbrood Disease)-	Yes		Anderson 1987
Bacteria			
<i>Paenibacillus larvae larvae</i> (American Foulbrood)	Yes	OIE List B Pathogen	Anderson 1987
Protozoa			
<i>Nosema apis</i> (Nosema Disease)	Yes	OIE List B Pathogen	Anderson 1987
<i>Malpighamoeba mellificae</i> (Amoeba Disease)	Yes	Not reported in HI ¹	Anderson 1987, 1988a, Bailey and Ball 1991, MAF 1994.
Viruses			
Sacbrood Virus	Yes		Ball and Bailey 1997
Chronic Bee Paralysis Virus	Yes	Not reported in HI ¹	Liu 1991, Furgala and Mussen 1978, Liu et al. 1987, Bailey and Ball 1991, Bruce et al. 1995
Acute Bee Paralysis Virus	Yes		Furgala and Mussen 1978, Liu et al. 1987, Bailey and Ball 1991, Bruce et al. 1995

Kashmir Bee Virus	Yes	Not reported in HI ¹	Anderson 1991, Furgala and Mussen 1978, Liu et al. 1987, Bailey and Ball 1991, Bruce et al. 1995
Black Queen Cell Virus	Yes	Not reported in HI ¹	Furgala and Mussen 1978, Liu et al. 1987, Bailey and Ball 1991, Bruce et al. 1995
Filamentous Virus	Yes		Furgala and Mussen 1978, Liu et al. 1987, Bailey and Ball 1991, Bruce et al. 1995
Bee Virus “X”	Yes		Liu 1991
Bee Virus “Y”	Yes		Liu 1991, Furgala and Mussen 1978, Liu et al. 1987, Bailey and Ball 1991, Bruce et al. 1995
Cloudy Wing Virus	Yes	Not reported in HI ¹	
Parasitic Mites			
<i>Acarapis dorsalis</i> Morgenthaler	Yes	Not reported in HI ¹	Morse 1978, CAPA 1991, Delfinado-Baker 1994, Anderson 1987
<i>Acarapis externus</i> Morgenthaler	Yes		Morse 1978, CAPA 1991, Delfinado-Baker 1994, Anderson 1987
<i>Varroa jacobsoni</i> = <i>Varroa destructor</i> (Anderson & Trueman)	Yes	Not reported in HI ¹	MAF 2000

Nonparasitic Mite Associates			
<i>Melittiphis alvearius</i> (Berlese)	Yes	Not reported in HI ¹ Predator on other arthropods in hives.	Morse 1978, CAPA 1991, Delfinado- Baker 1994, Anderson 1987, Eickwort 1997
<i>Neocypholaelaps zealandicus</i>	No	Phoretic on honey bees for transport to flowers.	Morse 1978, CAPA 1991, Delfinado- Baker 1994, Anderson 1987
Noninfectious Conditions			
Half-moon disorder	Yes		Anderson 1988b, Anderson and Gibbs 1988.
Melanism	Yes		
Beekeeping Pests			
<i>Galleria mellonella</i> (L.) Greater Wax Moth	Yes		MAF 1994
<i>Achroia grisella</i> (F.) Lesser Wax Moth	Yes		MAF 1994

¹“Not Reported” acknowledges information received from local beekeepers and apiary inspectors on the apparent absence of a virus in a State. The Hawaii Department of Agriculture finished (1/2002) a survey of the State for varroa and tracheal mite. No mites were found in the 837 hives sampled from 138 apiaries totaling 8400 hives. All islands were sampled (unpublished data, Hawaii Department of Agriculture communicate, 1/2002).

VI. List of Quarantine Pests

- A. **Quarantine significant diseases or pests in New Zealand** (diseases, pests, or adverse species or strains of honey bees that occur in New Zealand but not in the United States).

Varroa mite (note varroa does not occur in Hawaii)

- B. OIE List A Diseases in New Zealand** (transmissible diseases which have the potential for very serious and rapid spread, irrespective of national borders, which are of serious socio-economic consequence and which are of major importance in the international trade of animals and animal products)

NONE LISTED BY OIE.

- C. Undesirable Species, Subspecies or Strains of Honey bees**

NONE

The risk assessment for the continental United States stops here.

VII. Likelihood of Introduction into Hawaii

To determine an overall estimate of the likelihood of introduction of *Varroa destructor* into Hawaii, we estimated the following likelihoods based on the presence or absence of mitigation measures to prevent introduction:

	<i>Varroa destructor</i> Without OIE Mitigation	<i>Varroa destructor</i> With OIE Mitigation
Expected quantity of queens and packages imported annually	Low	Low
Likelihood of occurring in shipments	High	Low
Likelihood of surviving shipments	High	High
Likelihood of not being detected at the port of entry	High	High
Likelihood of moving to suitable habitats	High	High
Likelihood of finding suitable hosts	High	High

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The “low” estimate for *Varroa destructor* for the likelihood of occurring in shipments with OIE mitigation measures is the most critical in this pathway. This estimate is based on compulsory inspections, destruction, and reporting for this pest in New Zealand. These inspections, in conjunction with the restricted movement of bee colonies resulting from varroa, make it unlikely that any honey bees infected with *Varroa destructor* would be included in shipments. However, Hawaii Department of Agriculture has satisfactorily demonstrated that all of the Hawaiian Islands are free from varroa mite. Therefore, Hawaii must be given special consideration, separate from that for the contiguous 48 states. Nevertheless, based on these considerations, we conclude that the cumulative likelihood of introducing *Varroa destructor* is not zero.

VIII. Conclusion: Pest Risk Potential

Combining the risk ratings for the likelihood of transporting *Varroa destructor* (section VII), we conclude that the overall potential for pest risk is low for the continental United States as it is already present. Although varroa mite already occurs in the continental United States, varroa is listed as a pest of international importance relative to the movement of honey bees; therefore, with respect to Hawaii, specific risk mitigation measures are indicated. The varroa management plan for New Zealand (details can be found at: <http://www.beekeeping.co.nz/disease/vplan2d.htm#a4>) exceeds any measures in place in the United States, with the exception of Hawaii where state law prohibits the import of any honey bees to prevent the introduction of this pest. Risk mitigation specific to Hawaii may need to be considered because the Hawaii Department of Agriculture has indicated that Special considerations will be necessary for Hawaii, as Hawaii Department of Agriculture has satisfactorily demonstrated that all of the Hawaiian Islands are free from varroa mite (unpublished data, Hawaii Department of Agriculture communicate, 1/2002).

The island state of Hawaii presents a unique situation that merits separate analysis. Varroa mite and several of the honey bee viruses acknowledged as occurring in New Zealand have not been reported from Hawaii (section V). None of the viruses reported in section V of this risk assessment are actionable under OIE guidelines as these are not OIE List A or B pests and are not known to have an economic consequence for beekeepers (Shimanuki and Knox, 2000). Hawaii, however, has at least 62 species of endemic yellow-faced bees (Frank Howarth, pers. Comm.)(Colletidae: *Hylaeus* spp.). Approximately 35 of these are federally listed as species of special concern (<http://www.defenders.org/habitat/highways/new/states/images/hianimals.pdf>). Many species of *Hylaeus* are thought to be extinct as they have not been reported in nearly 100 years. (<http://hbs.bishopmuseum.org/endangered/ext-insects.html>). Also, several endangered Hawaiian plants

(silverswords: *Argyroxiphium* spp.) are pollinated primarily by yellow-faced bees. Honey bees visit the flowers of the silversword but are not effective at pollination (http://www.uhh.hawaii.edu/~scb/abstracts/Forsyth_S.htm).

There are no reports that *Hylaeus* spp. are susceptible to the maladies of *Apis mellifera*. We were unable to find any literature on the susceptibility of *Hylaeus* to honey bee viruses. However, it is notable that some species of *Hylaeus* nest in vacated bee and wasp nests (not *Apis mellifera*) (Michener, 2000). If *Hylaeus* were susceptible to any diseases that might occur with these hymenopteran species than *Hylaeus* has already been exposed to some of these maladies.

We feel it is unlikely that the yellow-faced bees are susceptible to varroa mite for two reasons: (1) Varroa attacks colonial bees, and *Hylaeus* is not colonial; and (2) varroa seems to prefer bees with longer development times. To elaborate, colonial or social behavior is important because varroa are transmitted in the colony through contact, proximity, and movement among bees within the hive. *Hylaeus* spp. are not social, thus not communal in their habits like honey bees, and therefore would not provide a suitable environment for the dissemination of the mite. Regarding reason 2, developmental time for the bees could also be a factor in determining susceptibility to this mite (Crane 1990). Varroa is native on *Apis cerana* where it attacks mostly drones which take longer to develop than worker bees. Once varroa moved onto *Apis mellifera*, a larger bee species, requiring more time to develop than *A. cerana*, varroa was then able to attack workers. We are unaware of any information about the development time for yellow-faced bees but speculate that times are generally shorter than *A. mellifera* because of their smaller size. Additional support for why varroa will probably not attack *Hylaeus* is provided from the wide distribution of *Hylaeus* on other continents where varroa occurs. If *Hylaeus* were attacked there should be varroa reports from Asia or Africa where *Hylaeus* is present. *Hylaeus* spp. are found in New Zealand and on all continents except Antarctica (Michener 2000).

We found no evidence of other *Apis* spp., *Apis* ssp., or strains, that would be of concern relative to the importation of adult honey bee queens, package bees, or germplasm from New Zealand. Likewise, we found no evidence of viruses or other disease organisms that posed significant risk to the import of adult honey bee queens, package bees, or germplasm. Nevertheless, the zoosanitary measures established by MAF for inspection of honey bees for export is comprehensive and these mitigation measures along with those in the proposed rule will safeguard honey bees.

The fact that pre-export inspections of honey bees in New Zealand will be based on visual examination of source colonies will not provide any safeguards to prevent shipping bees with those viruses that seem to have no economic impact on *Apis mellifera* (section V). However, those diseases that are not OIE list A or B may still pose a problem for the yellow-faced bees of special concern.

IX. Acknowledgments

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X. References

Anderson, D.L. 1987. Report by Dr. Denis Anderson, honey bee pathologist. New Zealand Beekeeper. 195:18-19, 22.

Anderson, D.L. 1991. Kashmir bee virus- a relatively harmless virus of honey bee colonies. Am. Bee J. 131:767-768.

Anderson, D.L., and A.J. Gibbs. 1988. Inapparent virus infections and their interactions in pupae of the honey bee (*Apis mellifera* L.) in Australia. Journal of General Virology 69:1716- 1625.

Bailey, L. and B.V. Ball. 1991. Honey bee pathology. 2nd Edition, 193 pp. Academic Press, Inc., London.

Bailey, L., and M.D. Collins. 1982a. Taxonomic studies on *Streptococcus pluton*. Journal of Applied Bacteriology 53:209-213.

Bailey, L., and M.D. Collins. 1982b. Reclassification of *Streptococcus pluton* (White) in a new genus *Melissococcus pluton*. Journal of Applied Bacteriology 53:215-217.

Bailey, L., and A.J. Gibbs. 1964. Acute infection of bees with paralysis virus. Journal of Insect Pathology 6:395-407.

Bailey, L., and R.D. Woods. 1977. Two more small RNA viruses from adult honey bees and further observations on sacbrood and acute bee-paralysis viruses. Journal of General Virology 37:175-182.

Ball, B.V. And L. Bailey. 1997. Viruses. Pp. 11-32. In Morse, R.A. and K. Flottum eds., Honey Bee Pests, Predators and Parasites., A. I. Root Co., Medina OH

- Barrows, E.M. 1975. Occupancy by *Hylaeus* of subterranean halictid nests (Hymenoptera: Apoidea). *Psyche* 82: 74-77.
- Clark, T.B. 1977. *Spiroplasma* sp., a new pathogen in honey bees. *Journal of Invertebrate Pathology* 29:112-113.
- Clark, T.B. 1978a. Honey bee spiroplasmosis, a new problem for beekeepers. *American Bee Journal* 118:18-19, 23.
- Clark, T.B. 1978b. A filamentous virus of the honey bee. *Journal of Invertebrate Pathology* 32:332-340.
- Colin, M.E., J.P. Faucon, A. Giauffret, and C. Sarrazin. 1979. A new technique for the diagnosis of acarine infestation in honey bees. *Journal of Apicultural Research* 18:222-224.
- Crane, E. 1978. The *Varroa* mite. *Bee World* 59:164-167.
- Crane, E. 1990. *Bees and Beekeeping: Science, Practice and World Resources*. 614 pp., Cornell University Press.
- Culliney, Thomas W. 1996. Transshipment of New Zealand honey-bees through Hawaii. *New Zealand BeeKeeper* 3(9):9-12.
- Dall, D.J. 1985. Inapparent infection of honey bee pupae by Kashmir and sacbrood bee virus in Australia. *Annals of applied Biology* 106:461-468.
- De Jong, D. 1997. Mites: Varroa and Other Parasites of Brood. Pp. 281-327. *In* Morse, R.A. and K. Flottum eds., *Honey Bee Pests, Predators and Parasites*, A. I. Root Co., Medina OH
- De Jong, D., D. De Andrea Roma, and L. S. Goncalves. 1982a. A comparative analysis of shaking solutions for the detection of *Varroa jacobsoni* on adult honey bees. *Apidologie* 13:297- 306.
- De Jong, D., P.H. De Jong, and L.S. Goncalves. 1982b. Weight loss and other damage to developing worker honey bees from infestation with *Varroa jacobsoni*. *Journal of Apicultural Research* 21:165-167.
- Delfinado-Baker, M. 1984. The nymphal stages and male of *Varroa jacobsoni* Oudemans - a parasite of honey bees. *International Journal of Acarology* 10:75-80.
- Delfinado-Baker, M. 1988. Incidence of *Melittiphis alvearius* (Berlese), a little known mite of beehives, in the United States. *American Bee Journal* 128:214.

Delfinado-Baker, M., and K. Aggarwal. 1987. Infestation of *Tropilaelaps clareae* and *Varroa jacobsoni* in *Apis mellifera ligustica* colonies in Papua New Guinea. American Bee Journal 127:443.

Delfinado-Baker, M., and E.W. Baker. 1982. Notes on honey bee mites of the genus *Acarapis* Hirst (Acari: Tarsonemidae). International Journal of Acarology 8:211-226.

Eickwort, G. C. 1997. Mites: an overview. Pgs. 241-250 In Morse, R.A. and K. Flottum (eds). Honey bee pests, predators, and diseases. Al Root; Medina, Ohio, USA.

Goodwin, M. and C. Van Eaton. 1999. Elimination of American foulbrood without the use of drugs; a practical manual for beekeepers. National Beekeepers' Association of New Zealand; Napier, New Zealand. 78 pgs.

Guzman de, L.I., T.E. Rinderer, and L.D. Beaman. 1993. Survival of *Varroa jacobsoni* Oud. (Acari: Varroidae) away from its living host *Apis mellifera* L. Experimental & Applied Acarology 17: 283-290.

Hung, A.C.F., H. Shimanuki, and D.A. Knox. 1996. Inapparent infection of acute paralysis virus and Kashmir bee virus in the U.S. honey bees. American Bee Journal 136:874-876.

Matheson, A. 1993. World bee health report. Bee World 74:176-212.

Matheson, A. and M. Reid. 1992. Strategies for the prevention and control of American foulbrood. American Bee Journal 132: 399-402, 471-475, 534-537.

Messing, R. H. 1991. Status of beekeeping in the Hawaiian Islands. Bee World 72:147-160.

Michael, A.S. 1957. Droplet method for observation of living unstained bacteria. Journal of Bacteriology 74:831-832.

Michener, C.D. 2000. The bees of the world. 913 pp., Johns Hopkins University Press, Baltimore

Office Internationale Des Epizootes. 2000. International Animal Health Code. [Http://www.oie.int](http://www.oie.int)

Otte, E. 1973. A contribution of the laboratory diagnosis of American foulbrood of the honey bee with a particular reference to the immunofluorescence method. Apidologie 4:331-339.

Pankiw, P., and J. Corner. 1966. Transmission of American foulbrood by package bees. Journal of Apicultural Research 5:99-101.

Peng, Y-S., and M.E. Nasr. 1985. Detection of honey bee tracheal mites (*Acarapis woodi*) by simple staining techniques. *Journal of Invertebrate Pathology* 46:325-331.

Peng, Y-S., and K-Y. Peng. 1979. A study on the possible utilization of immunodiffusion and immunofluorescence techniques as the diagnostic for American foulbrood of honey bees (*Apis mellifera*). *Journal of Invertebrate Pathology* 33:284-289.

Pinnock, D.E., and N.E. Featherstone. 1984. Detection and quantification of *Melissococcus pluton* infection in honey bee colonies by means of enzyme-linked immunosorbent assay. *Journal of Apicultural Research* 23:168-170.

Ragsdale, D.W., and B. Furgala. 1987. A serological approach to the detection of *Acarapis woodi* parasitism in honey bees using an enzyme-linked immunosorbent assay. *Apidologie* 18:1- 9.

Ragsdale, D.W., and K.M. Kjer. 1989. Diagnosis of tracheal mite (*Acarapis woodi* Rennie) parasitism of honey bees using a monoclonal based enzyme-linked immunosorbent assay. *American Bee Journal* 129:550-553.

Ritter, W., and F. Ruttner. 1980. Diagnoseverfahren (*Varroa*). *Allgemeine Deutsche Imkerzeitung* 5:134-138.

Shimanuki, H., and D.A. Knox. 1988. Improved method for the detection of *Bacillus larvae* spores in honey. *American Bee Journal* 128: 353-354.

Shimanuki, H., and D.A. Knox. 1991. Diagnosis of honey bee diseases. USDA, Agriculture Handbook No. AH-690, 53pp.

Shimanuki, H., and D.A. Knox. 2000. Diagnosis of honey bee diseases. USDA, Agriculture Handbook No. AH-690, 57pp.

Smith, I. Barton, Jr. 1998. 1997 Apiary Inspection Statistics. In *Proceeding of the 1998 Annual Conference Apiary Inspectors of America*. Lawrence, Kansas. 68 pp.

Szabo, T.I. 1989. The capping scratcher: A tool for detection and control of *Varroa jacobsoni*. *American Bee Journal* 129:402-403.

Toschkov, A., T. Vallerianov, and A. Tomov. 1970. Die Immunofluoreszenzmethode und die Schnelle und Spezifische Diagnostik der Amerikanischen Faulbrut bei der Bienenbrut. *Bulletin Apicole de Documentation et d'Information* 13:13-18.

White, G.F. 1912. The cause of European foulbrood. U.S. Department of Agriculture, Bureau of Entomology Circular 157, 15 pp.

White, G.F. 1918. Nosema disease. U.S. Department of Agriculture Bulletin 780, 59 pp.

White, G.F. 1920. European Foulbrood. U.S. Department of Agriculture Bulletin 810, 39 pp.

World Trade Organization. 1994. Agreement of Sanitary and Phytosanitary Measures.
<http://www.WTO.org>

USDA APHIS PPQ. 1997. Guideline for the Plant Pest Risk Analysis of Imported Commodities (version 1.7).

Zhavnenko, V.M. 1971. Indirect method of immunofluorescence in the diagnosis of foulbrood (American and European) (in Russian). Veterinariya (Kiev) 8:109-111.

Appendix I. OIE List B Diseases in New Zealand (transmissible diseases which are considered to be of socio-economic importance within countries and which are significant in the international trade of animals and animal products):

1. *Paenibacillus larvae larvae* (American Foulbrood)

This honey bee disease occurs in New Zealand and the United States, including Hawaii. *Paenibacillus larvae larvae* is a slender rod-shaped bacterium with slightly rounded ends and a tendency to grow in chains (Shimanuki and Knox, 1991). The spore is oval and approximately twice as long as wide. In larvae infected for less than 10 days, vegetative cells are present with some newly formed spores.

American foulbrood (AFB) disease can destroy a colony of bees if left untreated. The disease can occur anytime during the active brood rearing season. Larvae become immune about 72 hours after egg hatch. The most common means by which this disease is transmitted is by beekeepers who interchange brood combs between healthy and infected colonies. In addition, AFB can be transmitted colony-to-colony by adult bees and also by feeding healthy colonies honey from colonies with AFB. This disease is considered an economic pest and methods to mitigate this vary from country to country and state to state. In most jurisdictions bee inspections program, as we know them today, had their beginnings to mitigate AFB.

Possible sources of disease transmission: queens, package bees (artificial swarms), established colonies with combs, used beekeeping equipment, honey, and pollen.

The disease is detected by inspection of colonies during the brood rearing season. In the U.S., health certificates are traditionally issued by the state inspection services certifying a disease-free source apiary, date of last inspection and inspector's name. No practical method is available for certifying the absence of *Paenibacillus larvae larvae* in package bees and queens.

2. *Nosema apis* (Nosema Disease, Nosemosis).

Nosema disease occurs in New Zealand and the United States, including Hawaii. *Nosema apis* is the protozoan that causes nosema disease. *Nosema apis* spores are large, oval bodies that develop exclusively within the epithelial cells of the ventriculus of the adult honey bee. Nosema disease usually manifests itself in bees that are confined; therefore, the heaviest infections are found in winter bees, package bees, bees used for pollination in greenhouses, etc. Since nosema disease occurs worldwide, it was excluded from the Honeybee Act and its movement within the United States is not under statutory control.

The disease reduces the longevity of adult bees and hence can affect the productivity and survival of honey bee colonies. No single symptom typifies nosema disease. Differences between healthy bees and heavily infected bees can be seen by removing the digestive tract and examining the ventriculus. The ventriculus of a healthy bee is straw brown, and the individual circular constrictions are clearly seen. In a heavily infected bee, the ventriculus is white, soft, and swollen, obscuring the constrictions (White 1918). However, positive diagnosis can only be made by sacrificing adult bees from packages or queen cages for microscopic examination. Fecal material of queens can also be examined for the presence of *Nosema apis* spores.

Possible sources of disease transmission: queens, package bees (artificial swarms), established colonies with combs, and used beekeeping equipment.

3. *Varroa destructor* (= *Varroa jacobsoni*) (Varroosis)

Varroa destructor (Anderson & Trueman) is a revised name for *Varroa jacobsoni* Oudemans; however the old name, *jacobsoni*, has been widely used in publications. This parasitic mite occurs throughout the continental United States but is not known to occur in Hawaii. On April 11, 2000, we were notified by the New Zealand Ministry of Agriculture and Forestry that varroa had been detected the previous day on the North Island of New Zealand. Since the first draft of this risk assessment did not include consideration of the presence of varroa, we requested further information from MAF on the extent of and response to the infestation. Samples of varroa were received from New Zealand and determined by Dr. Lilia De Guzman (USDA Agricultural Research Service, Baton Rouge, Louisiana) to be the Korea haplotype or R genotype (Russian) of *Varroa destructor*. Dr. De Guzman utilized several molecular genetic techniques to determine that this is the same genotype as one of the two found in the continental United States. A delimiting survey conducted by MAF in New Zealand determined

that the varroa infestation was limited to the North Island, and no mites have been detected on the South Island

(<http://www.maf.govt.nz/biosecurity/pests-diseases/animals/varroa/index.htm>).

[Http://www.maf.govt.nz/biosecurity/pests-diseases/animals/varroa/20011214letter-south-movement-up-date.htm](http://www.maf.govt.nz/biosecurity/pests-diseases/animals/varroa/20011214letter-south-movement-up-date.htm)

This mite is found on adult bees, brood, and in hive debris. Female mites feed on developing brood, entering the cell before the bees seal it. The adult female mite is about 1.1 mm long x 1.5 mm wide, pale to reddish brown, and can be seen with the unaided eye. Male mites are smaller, pale to light tan, and are rarely encountered (De Jong 1997, Shimanuki and Knox 2000).

Varroa destructor is endemic on *Apis cerana* where it parasitizes only drone brood and does not have a profound effect on the health of the colony. In regions where *Apis cerana* and *Apis mellifera* occur together varroa has become a parasite of *Apis mellifera* (Crane 1990). Infestations are worse in *Apis mellifera* colonies because the mite feeds on worker brood in addition to drone brood (De Jong 1997).

Varroa destructor has been transported to more than 60 countries through the commercial movement of honey bees. Varroa has also been indicated as a vector of other bee diseases, therefore increasing the potential effects from this mite. First reported in the United States in 1987, this mite has become an important pest of honey bees throughout the Continental United States.

Detection is often difficult; populations build for several years before being detected. This was demonstrated with the widespread distribution of *Varroa destructor* in New Zealand at the time that it was first discovered on the North Island. In response to the detection of this bee parasite in New Zealand, the MAF immediately restricted the movement of bees and bee products from the North Island of New Zealand. Then MAF conducted delimiting surveys to determine the extent of the infestation of varroa mite in that country. The delimiting surveys show that the infestation is contained to a large portion of the North Island of New Zealand, North of 40 degrees South Latitude and, at present, is extensive enough to prevent the eradication of varroa mite from the North Island. Therefore, MAF, in consultation with New Zealand's beekeeping industry, developed a national management plan for Varroa mite. Under the management plan, the movement of bees and bee products within the North Island of New Zealand is monitored and subject to certain restrictions. In addition, the movement of bees and bee products from the North Island of New Zealand to the South Island of New Zealand, which is considered a pest free area for varroa mite, is subject to permit and restrictions. Funds have been made available for the use of miticides to help manage varroa in infested areas. The management plan also includes surveillance plans for the South Island of New Zealand to ensure early detection if varroa mite is introduced to that area of the country. Further information on New Zealand's varroa mite management plan may be found at:

<http://www.maf.govt.nz/biosecurity/pests-diseases/animals/varroa/phase-2-plan.pdf>

All exports of honey bees from New Zealand comply with the OIE standards (http://www.oie.int/eng/normes/mcode/A_00116.htm) for certification of shipments from regions where varroa mite occurs.

Possible sources of disease transmission: queens, package bees (artificial swarms), established colonies with combs, and used beekeeping equipment.

Control measures for varroa mite include several miticides and other chemicals with miticidal activity, among them, Fluvalinate, formic acid, and menthol.

The Hawaii Department of Agriculture finished (1/2002) a surveyed of the State for varroa and tracheal mite. No mites were found in the 837 hives sampled from 138 apiaries totaling 8400 hives. All islands were sampled.

Other Diseases, Pests or Physiological Maladies of Concern

1. Half-moon disorder

Half-moon disorder is reported from New Zealand but is not known to occur in the United States, including Hawaii. The disorder is not an infectious condition. Although bacteria have been isolated from larvae with the half-moon disorder, the bacteria were not the causative agent. The disorder is diagnosed strictly by the gross symptoms. Canada has been importing honey bee queens and package bees from New Zealand since the late 1960's, and if half-moon disorder were a problem, it would have likely been reported. Instead, we have a report of possibly one case in over 143,350 queens and 80,500 package bees imported into Canada from New Zealand.

Since half-moon disorder is not considered a transmissible disease, no sanitary measures can be imposed relative to imports of honey bees.

2. Kashmir bee virus.

Kashmir bee virus (KBV) occurs in New Zealand and the United States, but it is not reported in Hawaii. KBV was first isolated from adult *Apis cerana*, the Eastern honey bee, by Bailey and Woods (1977). Since then, KBV has been isolated from *A. mellifera* in New Zealand, Australia, Canada and the U.S. The KBV found in each of the countries are serologically related but not considered identical.

According to Bailey and Ball (1991), “the Australian strains of KBV were associated with severe mortality of adult bees in the field and have also appeared to cause death of larvae.” However, Australia has noted that subsequent research failed to demonstrate a causal association between KBV and mortality in honey bee larvae (Anderson 1991).

Possible sources of disease transmission: queens, package bees (artificial swarms), and established colonies with combs.

KBV is primarily transmitted “bee to bee” and can be readily transmitted by mite. Diagnosis of the virus requires activation of the virus by injecting a suspect suspension in an apparently healthy pupae and observing for symptoms and serologically confirming the presence of the virus.

The Hawaii Department of Agriculture indicates that KBV has not been reported from Hawaii, though no formal survey for this virus has been attempted.

3. Chronic Bee Paralysis Virus

Chronic bee paralysis disease is also referred to as the “hairless black syndrome.” The virus that causes chronic bee paralysis is widespread and occurs in New Zealand and the United States, but is not reported in Hawaii. However the disease rarely causes economic damage. Because the susceptibility to the disease is genetically inherited, generally out-crossing bee stocks remedies the situation.

Possible sources of disease transmission are package bees (artificial swarms), established colonies with combs, and queens.

Chronic bee paralysis virus is not easily detected. Although individual colonies may show adult bees with the symptoms of chronic bee paralysis disease, positive confirmation requires serology. This disease is not included in health certificates used for interstate movement of honey bees in the United States.

4. *Malpighamoeba mellifica* - Amoeba disease

This honey bee pathogen occurs in New Zealand and the United States, but is not reported in Hawaii. Amoeba disease occurs when adult bees ingest the cysts of the amoeba, *M. mellifica*. Because the amoeba is found in the Malpighian tubules, the evidence suggests that the infection impairs the function of the tubules. Amoeba disease is frequently found in association with another protozoan, *Nosema apis*.

No records are available on the occurrence of amoeba disease in the United States. It is doubtful that amoeba disease has an economic impact on beekeeping. No colony loss or honey loss data are available as a result of this disease.

Since this protozoan is found in the Malpighian tubules of adult bees, diagnosis can be made only by sacrificing the adult bees and removing the tubules for microscopic examination for the amoeba cysts. Possible sources of disease transmission: package bees (artificial swarms), established colonies with combs, and used beekeeping equipment.

5. *Melittiphis alvearius*

Melittiphis alvearius is a little-known mite that is associated with adult honey bees but is not considered to be a pest. Its distribution includes New Zealand and the United States, but it is not reported in Hawaii (reports not based on science-based survey data). It is unlikely that *M. alvearius* would be confused with other mites found in honey bee colonies. The adult female mite is ovate, flattened dorso-ventrally, 0.79 mm long and 0.68 mm wide, brown, and well sclerotized with numerous stout and spine like setae. The mite has been reported in California, Nova Scotia, New Zealand, England and continental Europe (Delfinado-Baker 1988). Although it is not reported to occur in Hawaii, no science-based survey data could be found to support such reports.

The scientific literature indicates that *Melittiphis alvearius* is one of the predatory mites that have been recorded to incidentally occur in beehives. Eickwort (1977) states that although *M. alvearius* is related to the important honey bee parasites *Tropilaelaps* and varroa, the predatory mesostigmatid mites do not harm honey bees or their brood. *M. alvearius* is presumed, on the basis of its morphology, to be a predator on other arthropods in beehives, although its feeding behavior has never been directly observed. Consequently, *M. alvearius* is not considered a quarantine pest subject to further consideration in this assessment.

APPENDIX II: Comments on Docket No. 99-091-1

On December 9, 1999, we published in the Federal Register (64 FR 68984, Docket No. 99-091-1) a notice of availability for a pest risk assessment titled, “Risk Assessment: Importation of Adult Queens, Package Bees, and Germ Plasm of Honey bees (*Apis mellifera* L.) From New Zealand.” We solicited public comment on the pest risk assessment for 60 days, ending February 7, 2000. By that date, we received 23 comments. They were from U.S. beekeepers, representatives of the U.S. beekeeping industry, State departments of agriculture, and a foreign government.

Two commenters supported our pest risk assessment as a whole. Five commenters expressed concerns about, or asked for changes to, portions of our pest risk assessment. In addition, 19

commenters raised issues, such as quality issues and trade issues, that are not directly relevant to our pest risk assessment. All of their comments are discussed below.

Comments on the Pest Risk Assessment

Comment: The pest risk assessment does not include sufficient information about the impact New Zealand's pest and diseases may have on non-*Apis* species in the United States.

Response: In the revised draft of our pest risk assessment, we address the potential impact of queens and package bees imported from New Zealand on yellow-faced bees in Hawaii. For the continental United States, our pest risk assessment determined that all of the significant bee diseases and pests found in New Zealand are also present on the continental United States. Therefore, non-*Apis* species on the continental United States have already had exposure to these diseases and pests.

Further, since 1985, Canada has imported honey bees from New Zealand. Because there are currently no restrictions on the importation into the United States of honey bees from Canada, we expect that honey bees from New Zealand have been imported into the continental United States via Canada since that time. Hawaii, however, has a State law prohibiting the movement of honey bees into that State. Therefore, we believe that while bees on the continental United States have been exposed to all of New Zealand's bee pests and diseases, Hawaiian bees have not. As a result, our proposal incorporates requirements based on the standards of the Office International des Epizooties (OIE), which is the standard-setting body recognized by the World Trade Organization for animal health, for the importation into Hawaii of queens and package bees from New Zealand.

Comment: The pest risk assessment needs to consider that the introduction of New Zealand viral strains (such as Kashmir bee virus (KBV), which is related but not identical to the strain of KBV found in the United States) may have more severe impact on honey bees in the United States than on honey bees in New Zealand. This is especially true if these viral strains can be vectored by the varroa mite.

Response: Appendix I of this revised pest risk assessment discusses Kashmir Bee Virus (KBV); however, we do not address different strains of KBV because that virus is not considered to be a significant disease of honey bees by OIE. As such, we cannot propose to impose special requirements on New Zealand queens and package bees imported into the United States based on KBV. We agree with OIE that KBV is not a significant disease of honey bees when it is the only disease or pest present. As the commenter notes, KBV is found in the United States. There is no evidence that the strain present in New Zealand is different from that found in the United States.

In addition, as discussed earlier, we expect that honey bees from New Zealand have been imported into the United States via Canada for many years. We have not identified any negative consequences in U.S. honey bees as a result of these importations.

Comment: The pest risk assessment appears to be based largely on old information. Any assessment based on data collected prior to the detection of varroa mite in the United States, and which fails to cite or consider the significant risks posed by varroa mite, is clearly defective.

Response: Much important and relevant scientific study of honey bees was performed before the detection of varroa mite in the United States. We believe that our pest risk assessment uses the best sources for information to document the presence or absence of bee diseases and parasites in New

Zealand and the United States. In addition, the pest risk assessment has been revised, primarily to address the recent appearance of varroa mite on the North Island of New Zealand and issues raised in these comments.

Comment: New Zealand honey bees appear to have white brood and halfmoon disease. These diseases do not occur in the United States. The pest risk assessment needs to address this situation.

Response: Appendix I of this revised pest risk assessment discusses half-moon disorder. The causative agent of half-moon disorder has not yet been identified and may possibly be a condition resulting from stress, not an infectious agent. Like KBV, half-moon disorder is also not considered to be a significant disease of honey bees by OIE.

White brood is not a recorded disease of bees. If the commenter is referring to chalkbrood (*Ascosphaera apis*), this revised pest risk assessment indicates that chalkbrood is present in New Zealand and the United States.

Comments on Other Issues

Comment: If you allow the importation of bees from New Zealand, “gene pollution” could occur. Specifically, New Zealand queens have not been subjected to natural selection for resistance to varroa or tracheal mites. Thus, New Zealand queens and package bees are almost certainly more susceptible to those parasites than are U.S. queens and bees. Consequently, it is highly probable that importation of New Zealand queens will reduce the average level of mite resistance in the U.S. bee population. Risk analysis demands assessment of the magnitude of harm that may ensue should this happen.

Response: This is a quality issue, not a pest risk issue. In terms of natural selection, if New Zealand queens and package bees are more susceptible to varroa mite or tracheal mite than U.S. honey bees, then New Zealand queens and package bees imported into the United States would be selected against and would not survive or proliferate in an apiary, or in the natural environment, in the United States. Further, if we were to allow the importation of adult queens and package bees from New Zealand, and if U.S. beekeepers experienced performance problems with those bees, then U.S. beekeepers would not continue to order queens or package bees from New Zealand.

Comment: Lower mite resistance could lead to the collapse of U.S. bee colonies to infestations of varroa and tracheal mites. It could also lead to increased use of chemical applications to U.S. hives to control these mites, which would in turn accelerate the mites’ resistance to the chemicals. Therefore, USDA should not allow imports of New Zealand honey bee stock.

Response: This is a quality issue, not a pest risk issue. As discussed above, if New Zealand queens and package bees are more susceptible to varroa mite or tracheal mite than U.S. honey bees, then New Zealand queens and package bees imported into the United States would be selected against and would not survive or proliferate in an apiary, or in the natural environment, in the United States. Such performance problems would likely result in reduced U.S. demand for New Zealand queens and package bees. Even if disease susceptibility is not an issue, if we were to allow the importation into the United States of honey bees and honey bee germ plasm from New Zealand, we estimate that few shipments of honey bees would be imported into the United States from New Zealand. U.S. interest in New Zealand honey bees centers on queens, which are available earlier in the year than queens

produced in the United States. For these reasons, we do not believe that, if we were to allow the importation of honey bees from New Zealand, those importations would lead to the increased use of chemical applications to U.S. hives or increased mite resistance to chemicals used to treat hives.

Comment: No controlled studies of interstrain matings between New Zealand and U.S. honey bees have been conducted. Therefore, it is possible that New Zealand strains harbor transposable elements or other genetically encoded mutator elements that might be activated by interstrain mating. It is incumbent upon USDA to conduct experiments to assess the safety of interbreeding between U.S. and New Zealand honey bees prior to allowing imports of New Zealand honey bees. This would help rule out the possibility of severe genetic abnormalities in the offspring of U.S. and New Zealand honey bees.

Response: This is a quality issue, not a pest risk issue. As discussed earlier, since 1985, Canada has imported honey bees from New Zealand. Canadian beekeepers have not reported any negative consequences from interbreeding. Further, since there are currently no restrictions on the importation into the United States of honey bees from Canada, we expect that bees from New Zealand have been imported into the United States via Canada for many years. We have not identified any negative consequences in U.S. honey bees as a result of these importations. Therefore, we do not believe that it is necessary to conduct experiments to assess the safety of interbreeding between U.S. and New Zealand honey bees prior to proposing to allow imports of New Zealand honey bees into the United States.

Comment: Reports from Canadian beekeepers indicate that New Zealand honey bees are inferior and aggressive. As evidence of their inferiority, Dr. Gard Otis (University of Guelph) uses New Zealand bees as the susceptible strain for research and testing of tracheal mite. Therefore, USDA should not allow imports of New Zealand honey bees.

Response: This is a quality issue, not a pest risk issue. Even if New Zealand honey bees are indeed “inferior and aggressive,” these traits do not offer a scientific basis for precluding their importation from the United States. Further, if we were to allow the importation into the United States of honey bees from New Zealand, and if New Zealand honey bees did exhibit these traits, then they would not be very popular with U.S. beekeepers.

Comment: Free importation should be available to all beekeepers, not only from New Zealand but from Europe as well.

Response: This is a trade concern, not a pest risk issue. We evaluate applications for the importation of honey bees on a case-by-case basis. That evaluation includes a thorough risk assessment of the honey bees and beekeeping industry in the exporting country. The risk assessment would determine whether the requesting country meets our requirements as an approved region for the importation of honey bees or honey bee germ plasm. Our primary goal is to ensure that the importation of honey bees and honey bee germ plasm does not introduce exotic bee diseases or pests into the United States.

Comment: We should not allow New Zealand to import queens and package bees into the United States until New Zealand discontinues its heavy tariffs on U.S. honey entering New Zealand.

Response: This is a trade concern, not a pest risk issue. In accordance with international trade agreements, we must make science-based regulatory decisions. In this case, our decisions must be

made on the disease and pest risk associated with the importation of honey bees and honey bee germ plasm from New Zealand. Therefore, we cannot make regulatory decisions based on the imposition of tariffs or on any other issue not based on science.

Comment: It is scientifically impossible to prove that New Zealand does not harbor unique bacteria, viruses, amoebae, paramecia, or other potentially dangerous honey bee pathogens or parasites. Therefore, we should not even consider allowing honey bee imports from New Zealand.

Response: This is a general risk issue. Our pest risk assessment determined that all of the significant bee diseases and pests found in New Zealand are also present on the continental United States. Further, as discussed earlier, Canada has imported New Zealand honey bees since 1985. Because there are currently no restrictions on the importation into the United States of honey bees from Canada, we expect that honey bees from New Zealand have been imported into the United States via Canada for many years. We have not identified any negative consequences in U.S. honey bees as a result of these importations.

Comment: You should encourage a referendum by U.S. beekeepers on this issue instead of going forth with a proposed rule.

Response: This is not a pest risk issue. The United States is obliged under international trade agreements to have science-based reasoning for denying another country's request for access to a U.S. market. Therefore, we must focus our evaluation of New Zealand's request to allow importation of honey bees and honey bee germ plasm into the United States only on the pest risk associated with such importations.

Questions

Comment: If the U.S. allows the importation of queens and package bees from New Zealand, would New Zealand in turn allow U.S. honey bee producers to export from the United States to New Zealand?

Response: That is a decision that New Zealand would make based on a separate risk assessment.

Comment: Why did the bees from Russia have to undergo quarantine in Baton Rouge, LA, and would this type of quarantine also apply to New Zealand queens and package bees?

Response: The Russian queens from the Primorye Territory of eastern Russia were held in an approved containment facility on Grand Terre Island, LA, to identify all diseases and pests that might be accompanying the bees. The importations were part of a research study conducted by USDA Agricultural Research Service Scientists under an APHIS permit. The bees were not allowed to be moved from containment until they were shown to be free of diseases and pests. The risk assessment prepared for the commercial importation of adult queens, package bees, and germ plasm of honey bees from New Zealand determined that all of the significant bee diseases and pests found in New Zealand are also present on the continental United States. Therefore, if we were to allow the importation into the United States of honey bees and honey bee germ plasm from New Zealand, there would be no reason to quarantine those honey bees.

Comment: Why does the United States prohibit domestic queen producers from importing honey bee semen from European countries known to have mite-resistant strains of honey bees?

Response: Honey bee semen can be imported under permit from Australia, Bermuda, France, Great Britain, and Sweden to a qualified containment facility. Any region may request that we conduct a risk assessment of their bees and beekeeping industry. The risk assessment would determine whether the requesting region meets our requirements for an approved region for the importation of honey bees or honey bee germ plasm.

Comment: Why are importations of semen that is proven safe and free of disease and parasites denied (example: denial of request to import semen from the Austrian Carnica Association via Ohio State University) while the risky importation of unproven New Zealand queens and package bees considered?

Response: Our existing regulations do not allow the importation of semen from Austria, except by USDA personnel. Furthermore, the facility at Ohio State University does not meet our requirements for designation as an approved containment facility. Honey bee germ plasm must be contained at an approved facility following importation to establish the identity and purity of the imported germ plasm. The risk assessment prepared for the importation of adult queens, package bees, and germ plasm of honey bees from New Zealand determined that all of the significant bee diseases and pests found in New Zealand are also present on the continental United States.

Comment: If it is important that trade be established with the beekeeping industry in New Zealand, then why not begin with the importation of semen to queen breeders in the United States or experimental importation of a limited number of queens and package bees to a quarantine facility?

Response: Prior to 1996 our regulations did allow the importation of semen from New Zealand, but we received very few applications for importation permits. In addition, our pest risk assessment determined that all of the significant bee diseases and pests found in New Zealand are also present on the continental United States, and the honey bees in both countries are taxonomically equivalent. Therefore, we believe that there is no reason to propose limiting the importation of germ plasm to queen breeders in the United States or to propose allowing only experimental importation of a limited number of queens and package bees to a quarantine facility. Much of the U.S. interest in New Zealand bee stock focuses on the early availability of New Zealand queens. If we were to allow the importation into the United States of honey bees and honey bee germ plasm from New Zealand, New Zealand queens would be available to U.S. beekeepers before beekeepers in the southern U.S. States can supply queens to the U.S. market for early pollination services.

Comment: Have U.S. beekeepers been adequately involved in the decision to propose queen and package bee imports from New Zealand?

Response: New Zealand first requested access to U.S. bee markets in 1978. We spent many years researching and preparing documentation related to New Zealand's request. In 1999, Dr. Wayne Wehling, APHIS, sought input from U.S. beekeepers at the annual meetings of the American Honey Producers Association, American Beekeeping Federation, U.S. Beekeepers, and the Apiary Inspectors of America. In addition, as discussed earlier, we published in the Federal Register a notice of availability for the New Zealand pest risk assessment and solicited public comment on that pest risk

assessment for 60 days. In addition, importation of honey bees from New Zealand would require a change in our regulations and all such proposed changes require public comment.

Comment: Have you considered the economic hardships that the U.S. beekeeping industry is currently facing? We are dealing with the Canadian border closure, low honey prices, a glut of imported honey, tracheal and varroa mite infestations, small hive beetle infestations, and the possibility of the introduction of Cape bee. Imports from New Zealand will only compound this situation.

Response: Before commercial importations from New Zealand could occur, our regulations have to be modified. Consideration of economic impacts are required for all changes in regulations, and would be included in all proposals we published for public comment. In addition, we anticipate that many U.S. beekeepers will view the proposed importation of honey bees and honey bee germ plasm from New Zealand as a benefit. The principal value of importing New Zealand queens and package bees would be the availability of queen and package bees in late winter when they are not available from sources in most of the United States.